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# Reconstructing the lives of Wari elites: Paleomobility and paleodiet at the archaeological site of Castillo de Huarmey, Peru

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ABSTRACT

Between approximately 500–1000 CE, much of what is now Peru was integrated into the Wari Empire, centered on the archaeological site of Huari in the Peruvian highlands. The recent discovery of the first unlooted Wari mausoleum of elite adult females, located at Castillo de Huarmey on the Peruvian coast, provides an unprecedented opportunity to understand the presence of this expansive state in northern Peru. Excavations at Castillo de Huarmey uncovered 58 high-status individuals, mostly adult females, buried with over 1300 spectacular mortuary artifacts and six human sacrifices. Here, we use radiogenic and stable isotope data from 68 enamel and bone samples from 34 individuals buried at Castillo de Huarmey to understand paleomobility and paleodiet at Castillo de Huarmey. For all archaeological human enamel and bone samples analyzed, mean $^{87}Sr/^{86}Sr = 0.70738 \pm 0.00030$ ($2\sigma$, $n = 68$), mean $\delta^{18}O_{carbonate(VPDB)} = -8.9 \pm 1.5$ ($2\sigma$, $n = 68$), and $\delta^{13}C_{carbonate(VPDB)} = -5.8 \pm 1.2$ ($2\sigma$, $n = 68$). We contextualize these data with data from baseline faunal, soil and water samples from the site. While there were no clear first-generation immigrants in the dataset, paleodietary variability may reflect ties with different regions.



## 1. Introduction

During the Andean Middle Horizon (c. 500–1100 CE), the Wari Empire spread across much of Peru. Wari-style material culture has been identified at a number of sites from northern to southern Peru, and Wari expansion is well documented through survey and excavations in the Wari heartland as well as hinterland sites, which were integrated by the expansive Wari road system (see overviews in Bergh, 2012; Isbell and McEwan, 1991; McEwan, 2005; Schreiber, 1992; Tung, 2012). Unfortunately, much of the data on elite Wari sites, particularly mortuary sites, comes from looted contexts. However, in 2012, Miłosz Giersz and his colleagues uncovered the first unlooted Wari elite women's mausoleum at the site of Castillo de Huarmey (Giersz, 2016; Giersz and Pardo, 2014) (Fig. 1). Fifty-eight noble individuals, mostly adult females, were buried in a rectangular chamber with a large number of unique artifacts and six human sacrifices. Although the desert north coast of Peru is marked by a number of beautifully-preserved high-status burials, such as the Moche tombs discovered at Sipán (Alva, 2003), Dos Cabezas (Donnan, 2007) and El Brujo (Mujica, 2007), or Sicán-Lambayeque tombs excavated at Batán Grande (Shimada, 1995) and Chornancap (Wester La Torre, 2016), biogeochemical studies are relatively rare, since these sites are associated with local archaeological cultures. The complex burial from Castillo de Huarmey, with its clear non-local cultural characteristics, including Wari burial pattern, unique non-coastal funerary architecture, and artifacts in non-local styles, provides an unprecedented opportunity to study a high-status mortuary context of possible non-local origin. We use biogeochemical approaches to understand the origins and paleodiet of the individuals buried in this spectacular tomb to elucidate the Wari presence in northern Peru.

Here, we first present an introduction to biogeochemistry in archaeology, focusing first on paleomobility through radiogenic strontium and stable oxygen isotopes and then introducing paleodiet through stable carbon and nitrogen isotope analysis. We then introduce the study area of the north coast of Peru, with a focus on the archaeological site of Castillo de Huarmey. We then present biogeochemical data from 68 enamel and bone samples from 34 individuals buried at the site of Castillo de Huarmey, as well as baseline data from modern and

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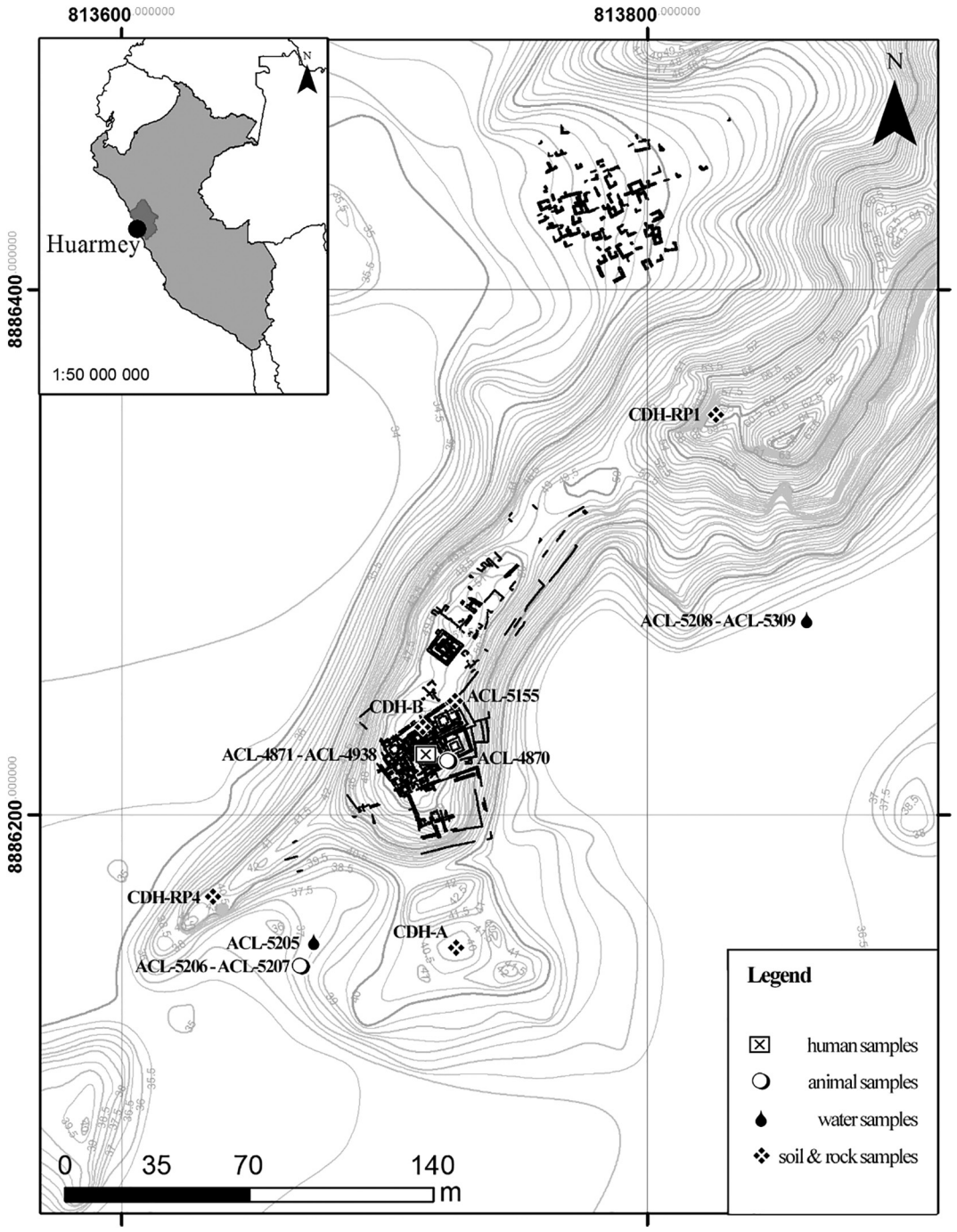


**Fig. 1.** Plan of the Castillo de Huarmey site in the North Coast of Peru with distribution of archaeological bone and enamel samples and baseline faunal, water, and soil samples discussed in the text (©PIACH).

archaeological fauna, soil, bedrock, and water samples. We conclude with our interpretations of these data, focusing particularly on the paleomobility and the origins of the individuals buried in this remarkable tomb, as well as their dietary practices.

## 2. Biogeochemistry in archaeology

### *2.1. Introduction to paleomobility studies through isotopic analysis*

Briefly, radiogenic strontium isotope data ($^{87}Sr/^{86}Sr$) varies geologically, and can be used to examine paleomobility in archaeological human remains (Bentley, 2006). During enamel and bone formation, bioavailable strontium is incorporated into human tissues, so that, if "local" strontium is consumed and/or imbibed, the $^{87}Sr/^{86}Sr$ values in enamel or bone will reflect the geologic region or regions in which that individual lived during enamel and bone formation. In the Andes, radiogenic strontium isotope data have documented paleomobility in a number of regions and polities, initially focusing on the South Central Andes, where the geologic variability is particularly well suited for $^{87}Sr/^{86}Sr$ studies (Andrushko et al., 2011; Andrushko et al., 2009; Knudson, 2008; Knudson et al., 2012a; Knudson et al., 2014a; Knudson et al., 2012b; Knudson and Douglas Price, 2007; Knudson and Torres-Rouff, 2009; Knudson and Torres-Rouff, 2014; Knudson and Tung, 2011; Knudson et al., 2005; Kurin et al., 2016; Tung and Knudson, 2006; Tung and Knudson, 2008; Tung and Knudson, 2010; Tung and Knudson, 2011; Turner et al., 2009). More recently, a number